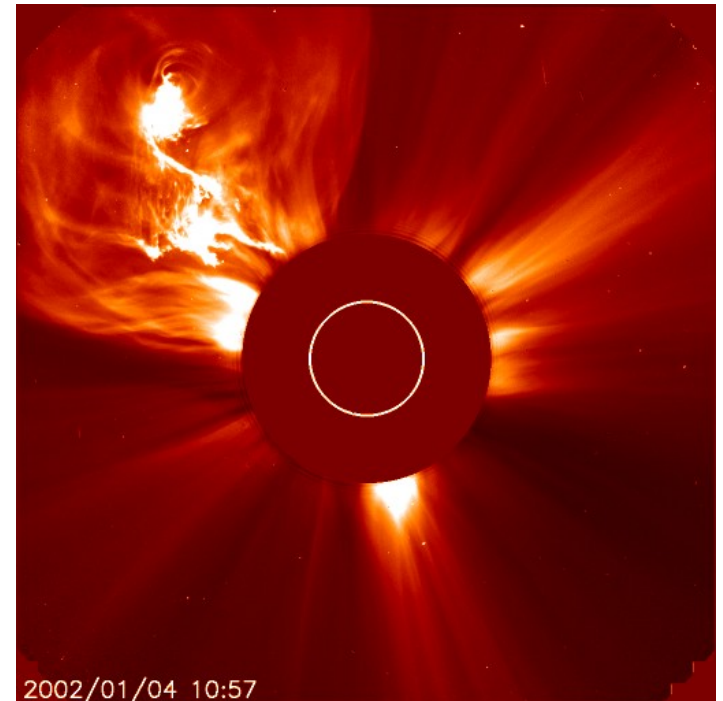


Space Weather and HI

Richard A. Harrison, RAL

STEREO is a major mission for Space Weather, both for 'enabling science' and for monitoring. HI is a key part of this. Several areas must be addressed:

- Direct observations of CME-Earth impacts
- Tracking the trajectory and development of CMEs in the heliosphere
- Event prediction
- Broadcast tools



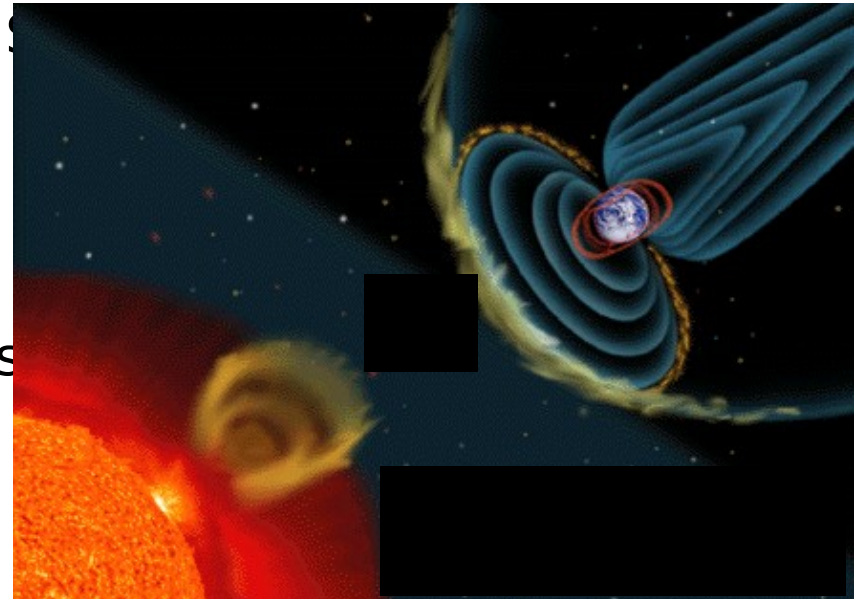
Space Weather and HI

➤ This is the FIRST opportunity to see CMEs and the Earth in the same FOV - and from two angles. It is an excellent, unprecedented opportunity for Earth-directed CME tracking and impact timing prediction.

Excellent for pioneering prediction and monitoring of CME/Earth impacts from out of the solar line.

Excellent for PR interest.

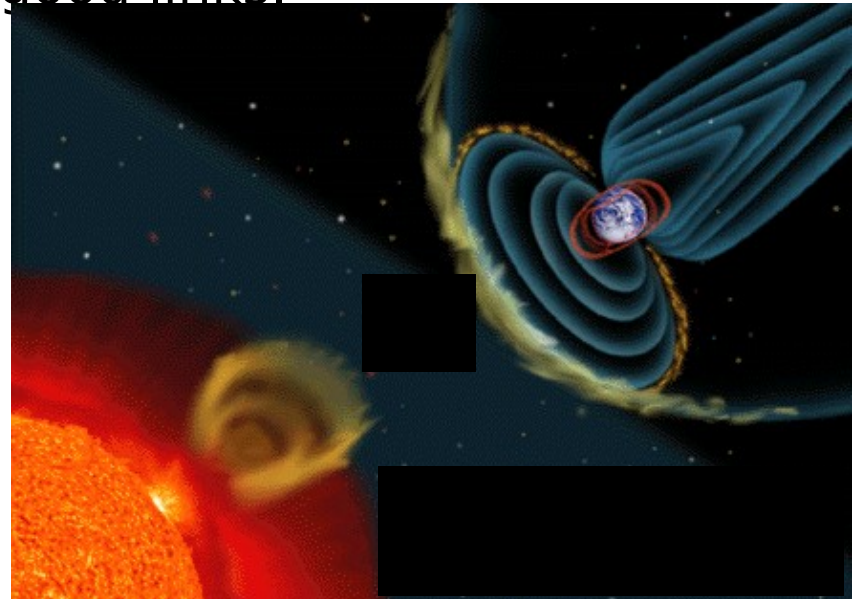
Superb tool for modelling 3-D structure and evolution of CMEs in interplanetary space.



Space Weather and HI

➤ Event prediction and forecast tools (i).

Standard operations: Given the HI cadence and efficient real-time processing time on the ground, we might be able to perform some prediction activity. This could provide a forecast capability of a few hours at best, but requires human activity and good links.



Space Weather and HI

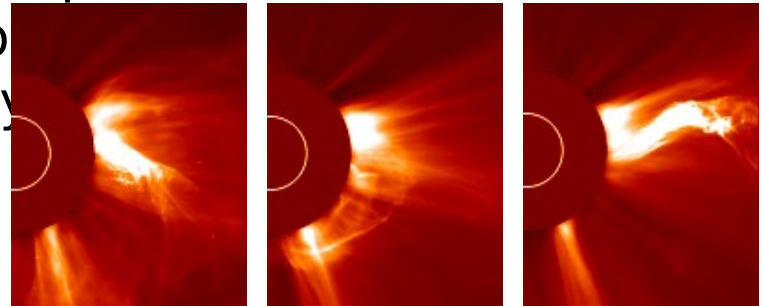
➤ Event prediction and forecast tools (ii).

Broadcast data: Perhaps a better, or parallel effort, would be either

(a) on-board event recognition - which requires sophisticated processing; or

(b) the transmission of thumbnail images - which requires dramatic spatial degradation and an assessment of the telemetry capability of such an option; or

(c) some kind of on-board 'index' - which could be a single intensity (N-S) strip at a particular location for every exposure of HI-2 or a p
field. Again, the telemetry consequences need study.



Space Weather and HI

➤ Event prediction and forecast tools (iii).

The basic aim is to develop a practical tool for event prediction.

- What sort of warning times and accuracy could we expect? Do we need to do better than, say, 1-2 hours?
- Can we develop any tools prior to launch or do we need to learn to use HI first? We must have some basic tools in place, but expect some in-flight development as we get to know the HI data.
- Can we develop a method for obtaining information at better than the standard synoptic cadence for the beacon? What are the telemetry limitations for the beacon w.r.t. HI?
- How can we best take advantage of the twin spacecraft

Space Weather and HI

➤ With regard to a UK contribution to the Space Weather aspects of the mission, we anticipate the use of the UK RAL ground station for broadcast data, much as we now do for ACE. In principle, this is no problem and initial discussions have taken place.

